

THE THIRD NUTRITION OF LIFE

GONGHUANG CHENG

Fisheries College, Guangdong Ocean University, Jiefang, Xiashan Zhanjiang, Guangdong, China

ABSTRACT

At present, as shown by current scientific documents, nutrition manners are categorized as phototrophic and heterotrophic, but there is actually a third, autotrophic (self-absorption). Based on research and observation, studies show it to be very common in plants and animals. Related textbooks should be changed to correct the traditional misunderstandings of biology.

KEYWORDS: Animal Nutrition, Phototrophy, Heterotrophy, Autotrophy, Self-Absorption

INTRODUCTION

In the early 2000s, the author studied marine life parasites in the South China Sea and collected 27 specimens which resembled the cestoda, *Anchistrocephalus microcephalus* from *Mola mola* (Rudolphi, 1819) and from *Novodon*. From the studies, a new description was discovered that was different from the original description of the type genus species, and there was at least one error in the cestoda scolex description: the scolex can have either bothrium or no bothrium, be armed or unarmed (Kennedy and Andersen, 1982), and can even have other special paradoxical characteristics. The samples had two bothria and were armed with a circle of ten rows of hooks on the scolex which was the main characteristic for the genus. Its tail, the end of the gravid proglottids, was also slender. Rudolphi (1819) might have taken this part of the worm as a kind of scolex as well. This phenomenon is rather similar to its Chinese ancestor, in which the gravid proglottids were the whole worm, *Taeniarhynchus saginatus* (Cheng, 2002).

How did this situation happen? This study reveals that the cestoda specimen preparation played an important role in leading to the confusion. At the beginning, the samples are usually sealed on the slide with a cover slide on the top of specimen. In doing so, the long cestoda specimens needed to be cut into small pieces; therefore it was easy to forget which one was the first, the middle or the end. This process was carefully observed by the author, and it was discovered that the specimens did not discharge gravid proglottids, but instead produced eggs. The empty proglottids were absorbed by the worm itself as an energy source.

METHOD AND MATERIALS

- The worms were obtained by dissecting fishes, stained and sealed on glass slider with Arabic gum, and covered with glass by the general method.
- Theoretical and Logical Studies.

RESULTS AND DISCUSSION

It was found that the worm became slender at the end of the gravid proglottid, thus indicating that the worm absorbs its own tissue as a nutrition source. This process is similar to other animal cases. The frog, for example, begins as a tadpole with a tail. As it develops, the tail disappears helping the frog to mature. There is no doubt that the tail is taken as nutrition and energy income for its development (Cheng, 2013). In addition, ascidians or sea squirts develop in a similar way by absorbing their tails as they mature. Humans are also no different. In their embryotic state, they possess a tail which is absorbed as nutrition and energy as the fetus grows.

As a result, the understanding of common nutrition manners defined as phototroph and heterotroph should be changed to accept a third that represents self-absorption – autotroph. Although it is believed that autotroph has the same meaning as phototroph, the two should have exclusive distinctions to clearly define the ways animals absorb nutrition and energy. This would not only change the base assumptions of truth, but also greatly influence the research done in life sciences. Thereby leading to changes in general biology textbooks as well as provide a new direction for zoological science research.

The third nutrition manner, “autotrophy”, is very common in Animalia, and can be seen in hibernation and aestivation. Hibernation, the season of heterothermy, is a state of inactivity and metabolic depression in endotherms. It is characterized by low body temperatures, slow breathing, low heart rates, and low metabolic rates. Aestivation creates similar responses and usually happens in summers and dry seasons. For each, affected animals take neither food nor photosynthesize; they self-absorb their nutrients and energy from lipocytes stored in the body. Without which, the animals would not have the metabolism to survive.

Cestodas are also of great importance, because through autotrophy, they regulate their nutrition and energy. Otherwise, without this process, they could die from over-absorption from their hosts.

Plants are no different. Sweet potatoes can produce new buds even if they remain in a dry place where there is no soil or even water. In this situation, they can neither use phototrophy nor heterotrophy, and it can therefore be concluded that they use autotrophy to provide their nutrition.

For humans, an interesting example is demonstrated with Chinese Taoists. On their path to enlightenment, they fast from all food and only drink water to sustain themselves. When in this state, these people are also “autotrophic” for a special period of time.

The aforementioned Animalia examples are great case studies for biologists who are studying the apoptosis of cells. Chinese scientist, Tung T. C.’s classical experimental research on amphibians, *Bufo Bufo gargarizuas*, *Rana nigromaculata* and *Rana chensinensis*, also provides great insights into these studies.

CONCLUSIONS

In addition to the common nutrition manners “phototrophy” and “heterotrophy”, there is another which is represented by self-absorption in Animalia – “autotrophy”. Therefore, the acceptance of a new designation for nutrition

manners, autotroph, will change the basic understandings of how plants and animals absorb nutrients and regulate energy.

ACKNOWLEDGEMENTS

The author thanks Dr. Linghao Li and Zachary Banker, MA for their kindness and patience while editing this manuscript.

REFERENCES

1. Cheng Gonghuang. Studies on the cestodas in China. [M] Beijing: Chinese women's publishing house, 2002: foreword, 1.(in Chinese)
2. Cheng GH, Cheng GS. The description of a marine fishes cestoda with the discussion on the third nutrition manner. *American Journal of Zoological Research*, 2014,2(2):29~32
3. Kennedy C. and Andersen K I. Redescription of *Anchtstrocephalus microcephalus* (Rudolphi) (Cestoda, Pseudophyllidea) from the sunfish *Mola mola*. *Zoologica scripta*, 1982, 11 (2) 101-105.
4. Tung T. C. Tung Y. Y. F., Chang C. Y. Studies on the induction of ciliary polarity in amphibian. *Proc. Zool. Soc.*, London, 1949, 118(4):1134-1179.

